

MUN Evaluation in Ag Drains Summary to Date

Sacramento Valley Archetypes

Colusa, Live Oak, Willows, Biggs

Sampling period: April – June 2012

Quarterly Review in July 2012



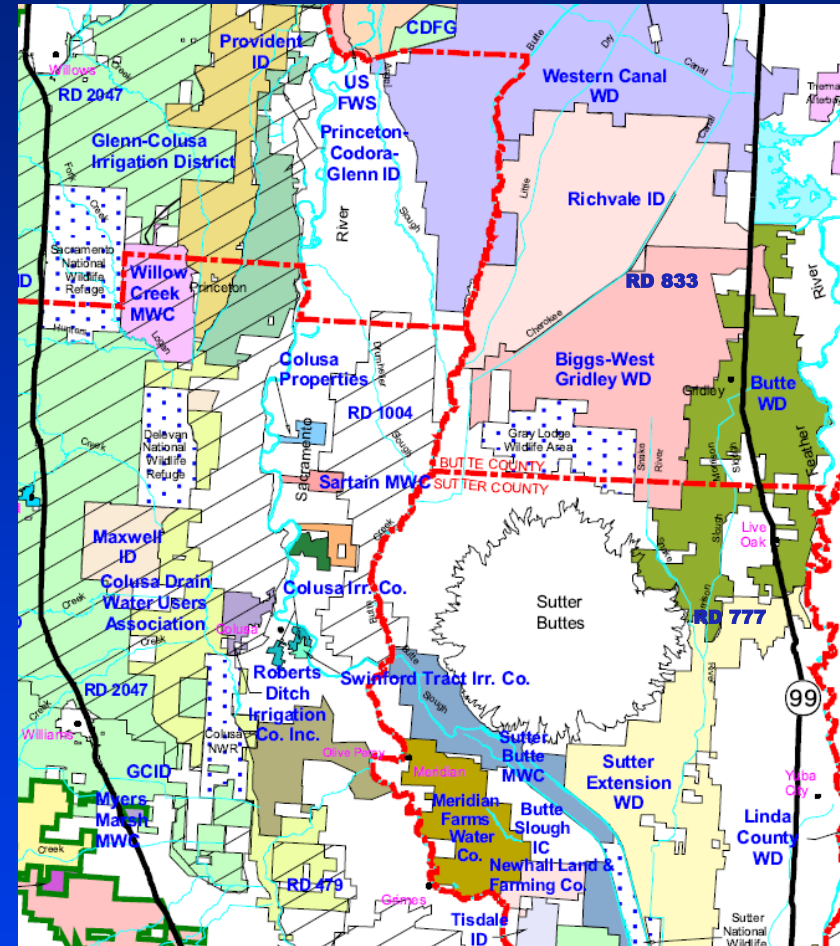
Outline

- Surveys/Meetings with Irrigation/Reclamation Districts
- CV-SALTS Technical Advisory Committee Recommendations
- Monitoring Parameters
- Lab Results
- Next Monitoring Events

Feb/March 2012 - Local Meetings

Representatives from:

- Biggs-West Gridley Water District
- Sutter Extension Water District
- Colusa Basin Drainage District
- Glenn-Colusa Irrigation District
- Reclamation District 777
- Reclamation District 833
- Glenn County Board of Supervisors
- Glenn County Dept. of Agriculture
- City of Biggs POTW
- City of Colusa POTW
- City of Live Oak POTW
- City of Willows POTW
- Sacramento Valley Coalition
- California Rice Commission



Site Surveys - Summary

- No indication of existing MUN use
- Areas are dominated by agriculture – much of it rice production
- Water bodies primarily constructed Ag. drains and channels
- Many potential diversions and reuse of water
- District maps were reviewed and used during the surveys

Site Surveys

West Side – Colusa Basin Drain

Colusa Area – March 6, 2012

- Two potential diversions from Colusa Basin Drain into Powell Slough upstream of effluent discharge
- New Ag. ditch upstream of effluent

Willows Area – March 6 & March 14, 2012

- Ag. Drain C goes through Sacramento Wildlife Refuge

Site Surveys (cont.)

East Side – Sutter Bypass

Live Oak Area – March 15, 2012

- During non-irrigation season, water in Lateral 1 is dominated by effluent
- Groundwater seepage another source of water (Butte Sink)

Biggs Area – March 21, 2012

- Water from the Cherokee Canal is diverted to Duck Clubs in the Butte Creek area

CV-SALTS TAC (3/9/2012)

Recommendations

- In general, monitoring approach and questions approved
- Better to monitor for more parameters than less for the first three months
- Critical review of monitoring plan after first 3 months
 - ◆ Review constituents, frequency, period of monitoring, sites
- Have subsequent reviews every 3 months
- Flow data not worth expense
 - ◆ Photos; temperature sensors; some instantaneous

CV-SALTS TAC (3/9/2012)

Policy Issues

- Initiate efforts on developing a “decision tree”
 - ◆ If/when/what monitoring is needed
- Definition of “sustained yield” for surface water
 - ◆ Comparison of DPH recommendation vs. Drinking Water Policy
- Determining “baseline” for highly modified systems
- Determine how much “weight” local grower opinions should have in decision process

Reasonable Potential Analysis

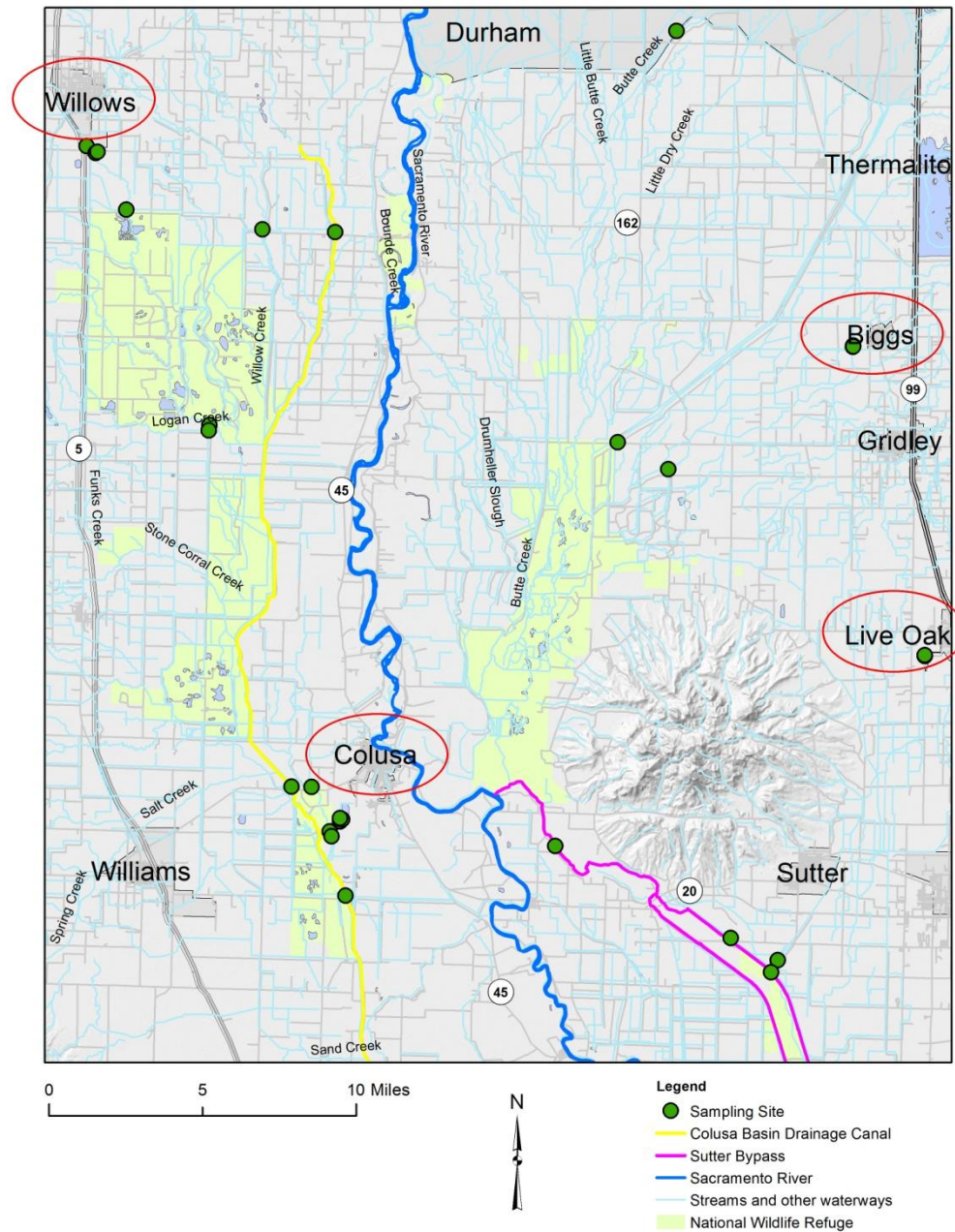
- Parameters with reasonable potential to increase concentration over criteria
 - ◆ Colusa
 - Nitrate+Nitrite as Nitrogen, Aluminum
 - ◆ Live Oak
 - Nitrate+Nitrite as Nitrogen, Arsenic, Manganese, Iron, Aluminum
 - ◆ Willows
 - Nitrate+Nitrite as Nitrogen, total trihalomethanes
 - ◆ Biggs
 - Electrical conductivity
- Total Dissolved Solids is expected to be directly related to Electrical Conductivity (Colusa NPDES Permit)

April-June 2012

Monitoring Parameters

- 1/month (key constituents):
 - ◆ Volatile Organic Compounds, MBAs, Nitrate as Nitrogen, Nitrite as Nitrogen, boron, sodium, total: aluminum, arsenic, iron, manganese
- 2/month:
 - ◆ Specific conductivity, turbidity, pH, dissolved oxygen, temperature

MUN Beneficial Use Study - Site Map

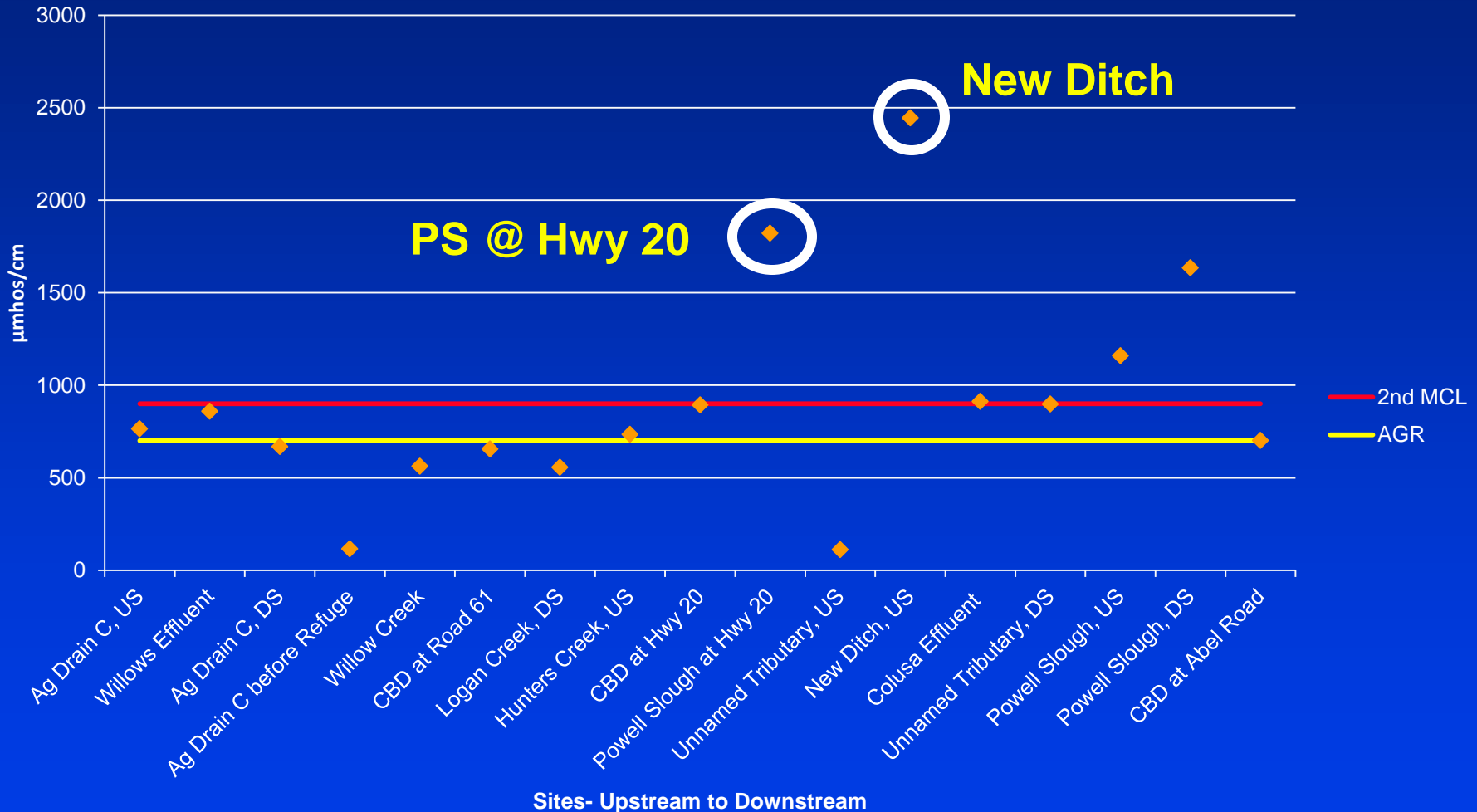


Monitoring Sites

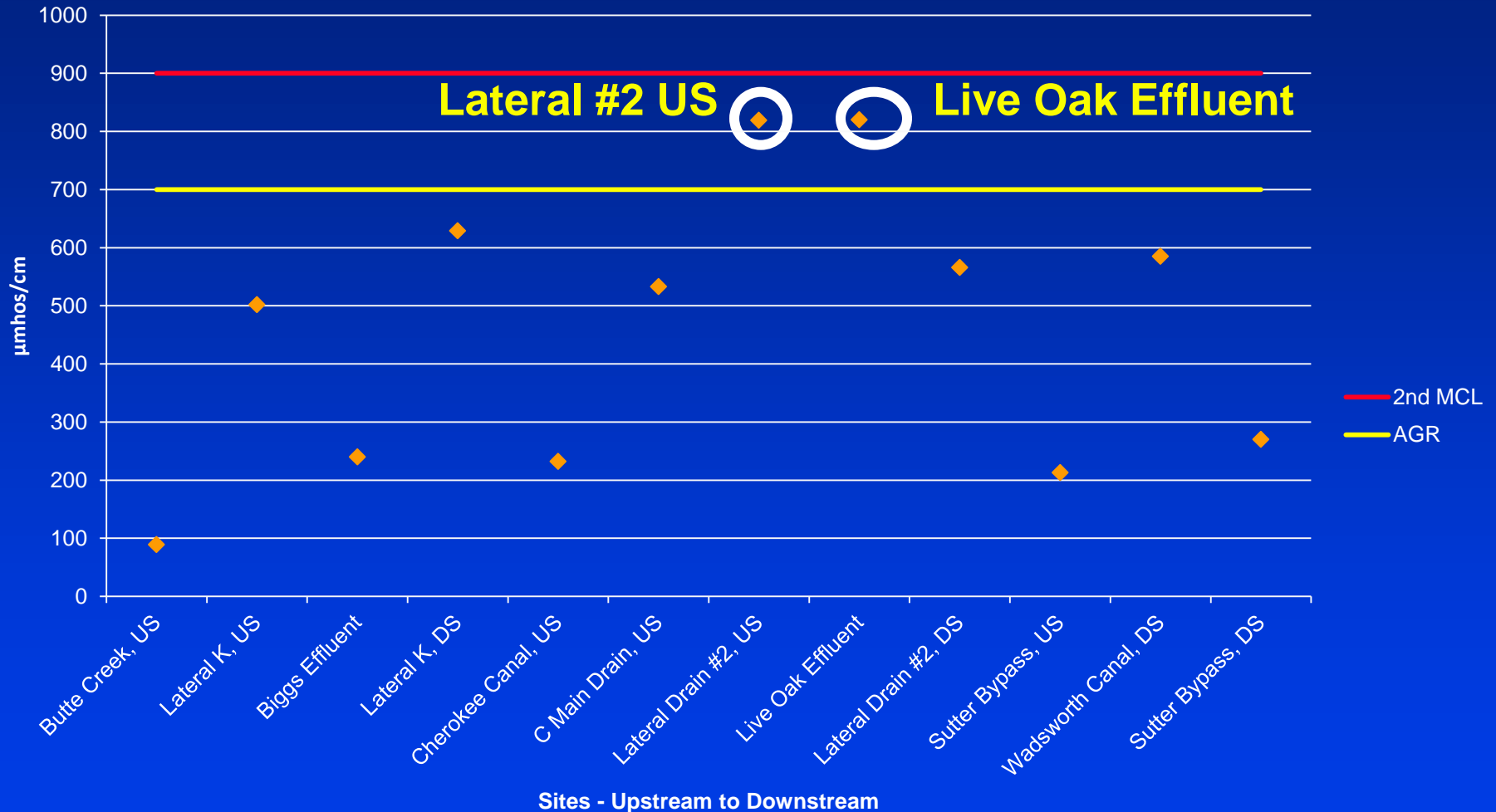
Study Area	# of Sites	Cost (\$) for April – June 2012
Biggs	7	\$2,798
Colusa	9	\$3,705
Live Oak	6	\$2,535
Willows	8	\$3,315
TOTAL	30	\$12,353

West Side - Colusa Basin Drain

Specific Conductivity

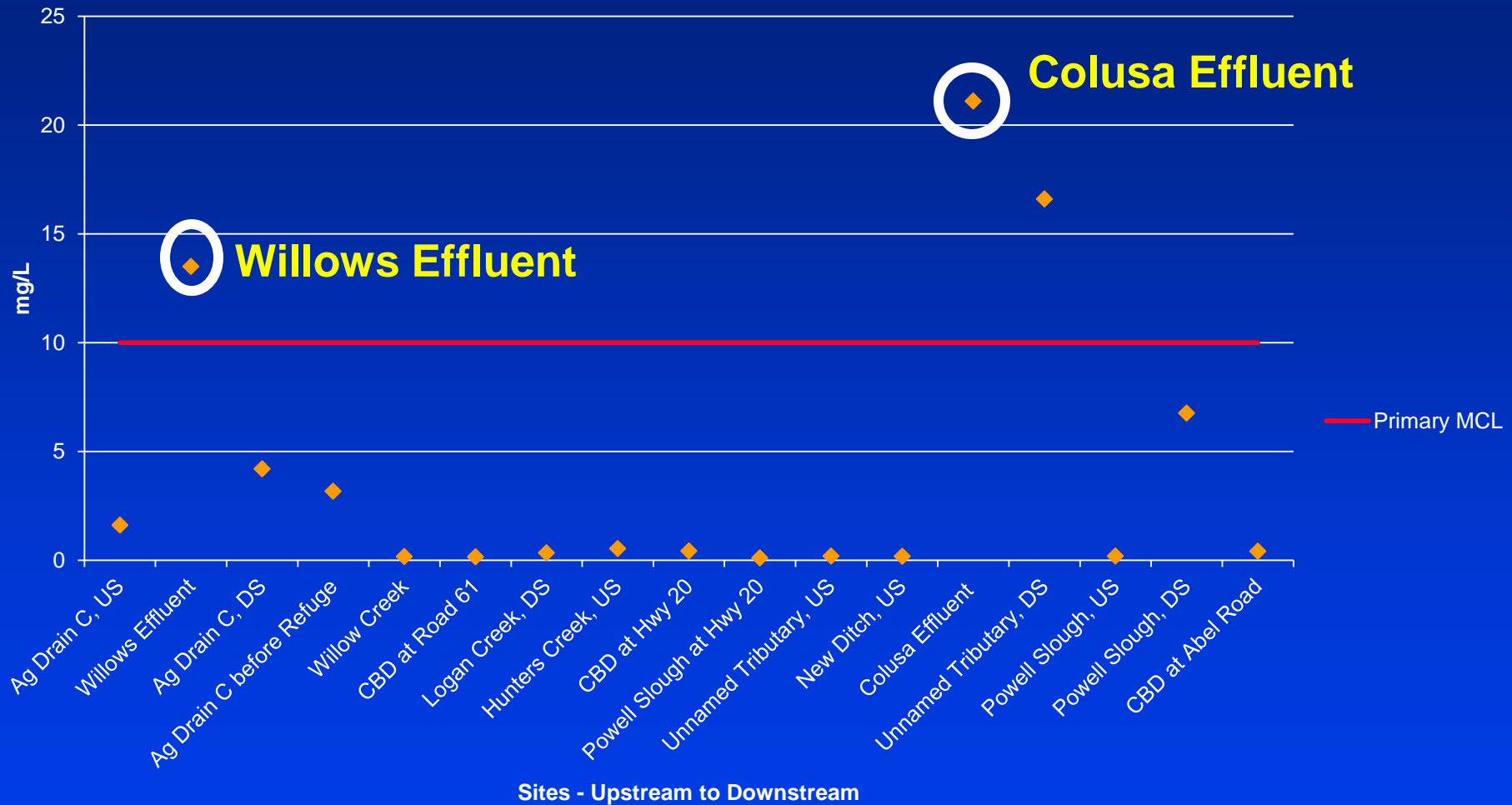


East Side - Sutter Bypass Specific Conductivity

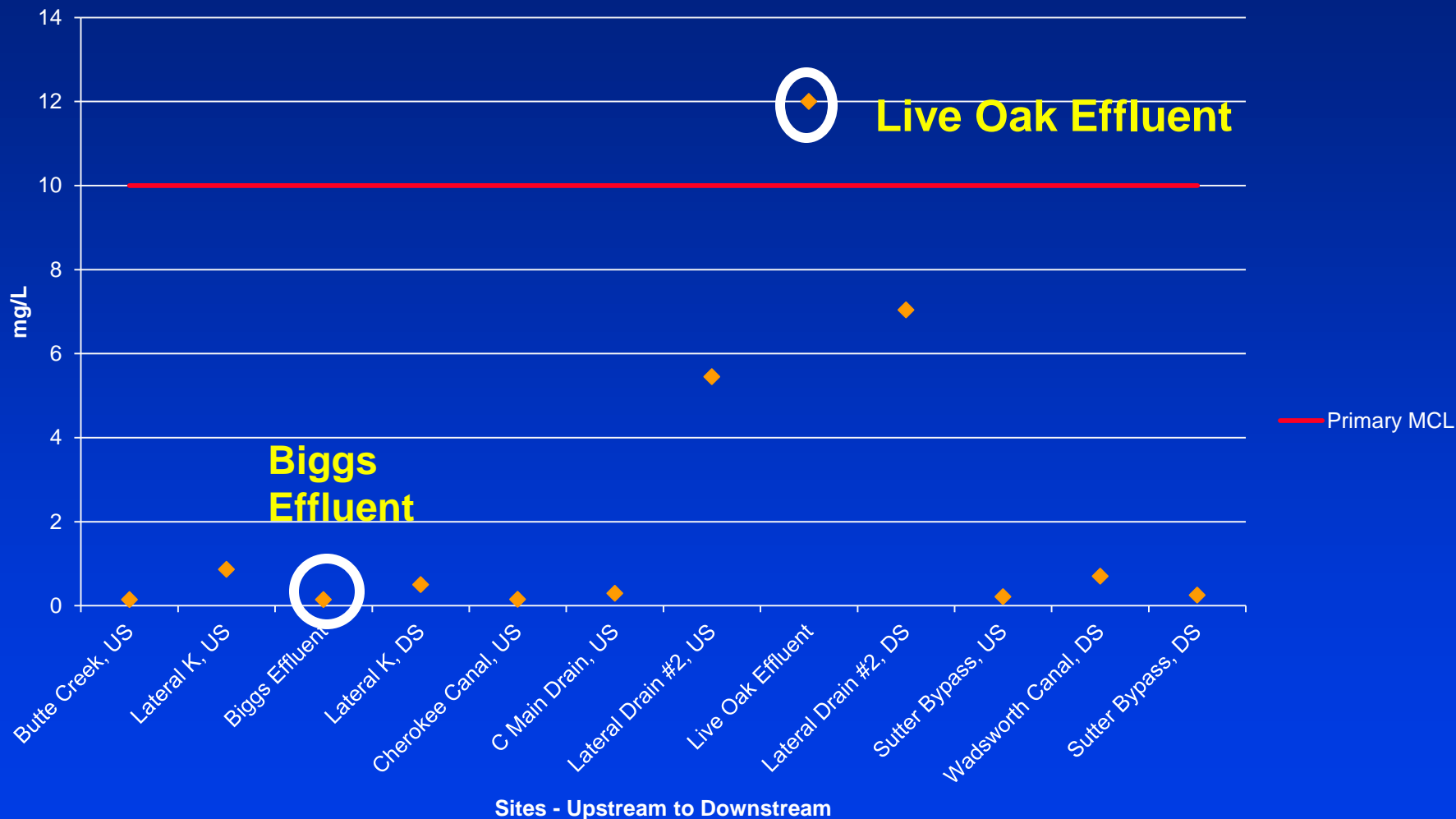


West Side - Colusa Basin Drain

Nitrate as Nitrogen



East Side - Sutter Bypass Nitrate as Nitrogen



Results: Field Measurements

- Turbidity >5 NTU (2nd MCL) at most sites
 - ◆ Turbidity < 5 NTU at Butte Creek, Lateral #2 DS & US, Effluent for Colusa, Live Oak, and Willows
- Most sites had pH values within 6.5 – 8.5 (2nd MCL and Basin Plan Objective) except C Main Drain [8.56], Unnamed Tributary (US of effluent) [8.63], and Powell Slough (DS of effluent) [8.90]

Results: Lab Analyses

- Sodium results >20 mg/L (EPA Drinking Water Advisory) at most sites
 - ◆ Sodium results below 20 mg/L at Butte Creek, Cherokee Canal, and Sutter Bypass
- One Boron result >1 mg/L , but all other sites were below DPH Notification Level for Drinking Water
 - ◆ High result in new ditch upstream of effluent pipe in Colusa study area

Results: Lab Analyses

- Aluminum results $>200 \mu\text{g/L}$ (2nd MCL) at most sites
 - ◆ Aluminum results $<200 \mu\text{g/L}$ at Lateral #2 DS, Butte Creek, Effluent for Colusa, Live Oak, Willows, and Biggs
- Total Trihalomethane results $<80 \mu\text{g/L}$ (MCL) at all sites
 - ◆ Bromodichloromethane result $> 0.56 \mu\text{g/L}$ (CTR) at Willows Effluent

Results: Lab Analyses

- MBAs results $< 500 \mu\text{g/L}$ (2nd MCL) at all sites
- Arsenic results $< 10 \mu\text{g/L}$ (MCL) at most sites
 - ◆ One Arsenic result $> 10 \mu\text{g/L}$ at Live Oak Effluent
- Manganese results $> 50 \mu\text{g/L}$ (2nd MCL) at most sites
 - ◆ Manganese results $< 50 \mu\text{g/L}$ at Effluent for Colusa, Live Oak, Willows, and Biggs, Butte Creek

Photos



Powell Slough, Upstream of Unnamed tributary. Picture is looking downstream

Photos



Ag Drain C at Road 60, before water enters Wildlife Refuge. Looking upstream

Photos



Lateral Drain #2, downstream of effluent. Looking upstream

Photos



Lateral K, upstream of effluent discharge. Looking downstream

Next Monitoring Event

- Field measurements on May 9 and May 10, 2012
- Key constituents and field measurements week of May 21-25

Questions?

- Data will be available on-line

List of Sites

- Biggs Study Area
 - ◆ Butte Creek near Nelson Road
 - ◆ Lateral K upstream of effluent
 - ◆ Effluent
 - ◆ Lateral K downstream of effluent
 - ◆ Cherokee Canal upstream of effluent
 - ◆ C Main Drain upstream of Cherokee Canal
 - ◆ Butte Creek in Duck Club/Butte Slough at Meridian

List of Sites

- Colusa Study Area
 - ◆ CBD at Highway 20
 - ◆ Powell Slough at Highway 20
 - ◆ Effluent
 - ◆ Unnamed Tributary upstream of effluent
 - ◆ New Ditch upstream of effluent
 - ◆ Unnamed Tributary downstream of effluent
 - ◆ Powell Slough upstream of unnamed tributary
 - ◆ Powell Slough downstream of unnamed tributary
 - ◆ CBD at Abel Road

List of Sites

- Willows Study Area
 - ◆ Effluent
 - ◆ Ag Drain C upstream of effluent
 - ◆ Ag Drain C downstream of effluent
 - ◆ Ag Drain C at Road 60
 - ◆ Willow Creek at Road 61
 - ◆ CBD at Road 61
 - ◆ Logan Creek downstream of effluent
 - ◆ Hunters Creek upstream of effluent

List of Sites

- Willows Study Area
 - ◆ Effluent
 - ◆ Ag Drain C upstream of effluent
 - ◆ Ag Drain C downstream of effluent
 - ◆ Ag Drain C at Road 60
 - ◆ Willow Creek at Road 61
 - ◆ CBD at Road 61
 - ◆ Logan Creek downstream of effluent
 - ◆ Hunters Creek upstream of effluent

City of Colusa Study Area



0 1 2 Miles



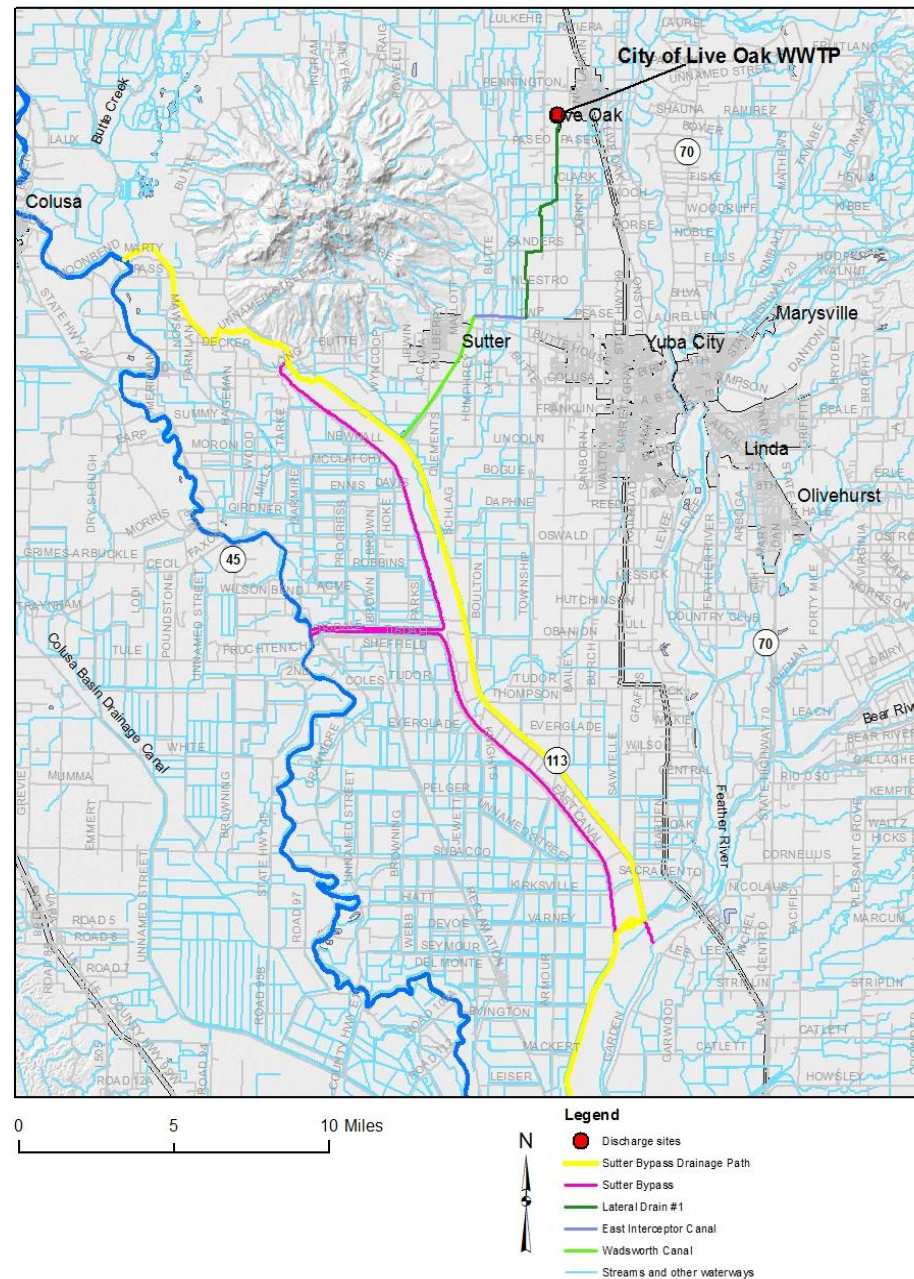
Legend

- Effluent discharge sites
- ✕ Receiving Water Monitoring sites
- Proposed New Sites (Locations are ESTIMATED)
- ▲ ILRP Monitoring Sites
- Colusa Basin Drainage Canal
- Sacramento River
- Streams and other waterways
- National Wildlife Refuge

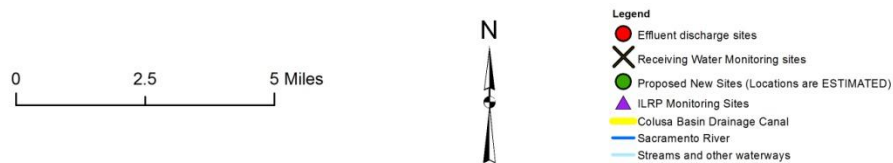
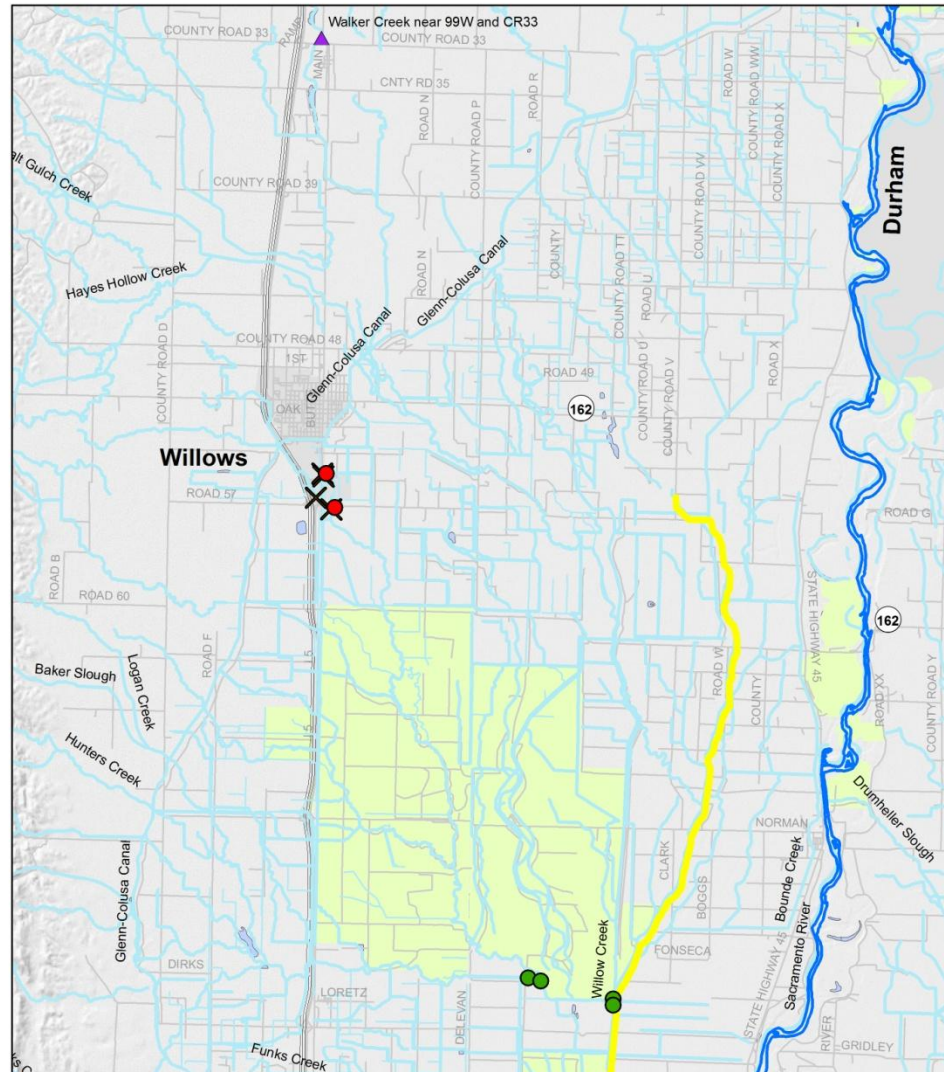
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31

City of Live Oak Wastewater Treatment Plant



City of Willows Study Area



City of Biggs Study Area

